

WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a plurality of heat dissipating paths, each for each of a pre-set number of terminals of an active element, said heat dissipating paths being adapted for transmitting heat from the terminals of said active element to a heat sink member, wherein

said pre-set number of terminals being constructed so as not being electrically connected to one another by said heat radiating paths and said heat sink members.

2. The semiconductor device as defined in claim 1 wherein, in at least one of the heat dissipating paths, there is inserted in a path reaching said heat sink member a member exhibiting good thermal conductivity and electrically insulating properties, termed as an "insulating member".

3. A semiconductor device wherein a first terminal of the active element is connected via an electrically conductive member to a heat sink member, and wherein a second terminal of the active element transmits heat to said heat sink member via at least an insulating member interposed in-between.

4. The semiconductor device as defined in claim 1 wherein said heat sink member is a heat sink member of a package mounting the active element.

5. The semiconductor device as defined in claim 2 wherein

said heat sink member is a heat sink member of a package mounting the active element.

6. The semiconductor device as defined in claim 3 wherein said heat sink member is a heat sink member of a package mounting the active element.

7. A semiconductor device wherein an electrode of an active element formed on a substrate, termed as a "first electrode", is connected to an electrically conductive member, and at least one of the other electrodes of the active element, termed as a "second electrode", is connected to said electrically conductive member via an insulating member, said electrically conductive member abutting to a heat sink member of a package.

8. The semiconductor device as defined in claim 7 wherein said active element is comprised of a field effect transistor FET, and wherein said first and second electrodes are a source electrode and a drain electrode, respectively.

9. A semiconductor device wherein at least one terminal of an active element is connected via an insulating member to a heat sink member of a package used for mounting the active element.

10. The semiconductor device as defined in claim 9 wherein said insulating member is arranged on at least one of (a) a terminal surface of said active element and/or (b) a heat

sink member side of the package used for mounting the active
5 element.

11. The semiconductor device as defined in claim 2 wherein
the insulating member comprises aluminum nitride.

12. A method for producing a semiconductor device in which
an active element formed on a substrate is connected to a
heat sink member of a package accommodating said active
element, comprising the steps of:

5 (a) forming a gate electrode on said substrate;

(b) forming a first insulating film having holes provided in
the substrate at position of a drain electrode and a source
electrode respectively;

(c) forming said drain electrode and said source electrode
10 on said substrate;

(d) forming a second insulating film on the entire surface
of said substrate and planarizing the surface until said
drain electrode and the source electrode are exposed;

(e) forming an insulating member on said drain electrode;

15 (f) forming on said substrate a third insulating film having
a hole provided at the position of the source electrode and
planarizing the surface until the surface of said
insulating member of said drain electrode is exposed; and
(g) forming an electrically conductive member on said third
20 insulating film.

13. A method for producing a semiconductor device in which

source electrode respectively;

(c) forming said drain electrode and said source electrode
10 on said substrate;

(d) providing on said package an insulating member at a
position facing the drain electrode of said active element;

(e) providing a metal protuberance on said package in
register with the source electrode of said active element;

15 (f) bonding said active element and the package so that said
source electrode of said active element and the metal
protuberance of said package face each other and so that the
drain electrode and the insulating member of said package
face each other.

15. The method for producing a semiconductor device as
defined in claim 12 wherein said insulating member
comprises aluminum nitride.

16. The method for producing a semiconductor device as
defined in claim 13 wherein said insulating member
comprises aluminum nitride.

17. The method for producing a semiconductor device as
defined in claim 14 wherein said insulating member
comprises aluminum nitride.

18. The method for producing a semiconductor device as
defined in claim 12 wherein said active element is a high-
output-power FET formed on a GaAs substrate and wherein said
insulating member comprises aluminum nitride.

an active element formed on a substrate is connected to a heat sink member of a package accommodating said active element, comprising the steps of:

- 5 (a) forming a gate electrode on said substrate;
- (b) forming a first insulating film having holes provided in the substrate at positions of a drain electrode and a source electrode, respectively;
- (c) forming said drain electrode and the source electrode on
10 said substrate;
- (d) forming a second insulating film on the entire surface of the substrate and planarizing the surface until the drain electrode and the source electrode are exposed;
- (e) forming an insulating member on said drain electrode;
- 15 (f) forming a metal protuberance on said package in register with the source electrode of said active element; and
- (g) bonding said active element and the package so that said source electrode of said active element and the metal protuberance of the package face each other.

14. A method for producing a semiconductor device in which an active element formed on a substrate is connected to a heat sink member of a package accommodating said active element, comprising the steps of:

- 5 (a) forming a gate electrode on said substrate;
- (b) forming a first insulating film having holes provided in the substrate at positions of a drain electrode and a

19. The method for producing a semiconductor device as defined in claim 13 wherein said active element is a high-output-power FET formed on a GaAs substrate and wherein said insulating member comprises aluminum nitride.

20. The method for producing a semiconductor device as defined in claim 14 wherein said active element is a high-output-power FET formed on a GaAs substrate and wherein said insulating member comprises aluminum nitride.

2025 RELEASE UNDER E.O. 14176